Three prevalent multidrug-resistant strains among human Salmonella isolates in the United States, 1999-2000: S. Typhimurium R-type ACSSuT, S. Typhimurium R-type AKSSuT, and S. Newport R-type ACSSuT

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Background: Each year, an estimated 1.4 million persons are infected with Salmonella in the United States. Increasing antimicrobial resistance, including multidrug resistance, contributes to human health burden of Salmonella and threatens the utility of commonly used agents including third generation cephalosporins (e.g., ceftriaxone).

Methods: After serotyping, the 17 public health laboratories in state or local health departments participating in the National Antimicrobial Resistance Monitoring System (NARMS) for Enteric Bacteria forward every tenth Salmonella to CDC. Isolates are tested by broth microdilution (Sensititre) for antimicrobial susceptibility for 15 antimicrobial agents including ampicillin (A), chloramphenicol (C), kanamycin (K), streptomycin (S), sulfonamides (Su), and tetracycline (T), and interpreted with NCCLS breakpoints.

Results: Of the 2613 isolates tested in 1999-2000, 26% (679) were resistant to >1 agent; 21% (546) were multidrug resistant (resistant to >2 agents). Three multidrug resistant strains accounted for 10% (263/2613) of all Salmonella isolates, 38% (263/679) of the resistant isolates and 48% (263/546) of the multidrug resistant isolates. In particular, 30% (162/546) of multidrug resistant Salmonella were S. Typhimurium R-type ACSSuT, 12% (63/546) were S. Typhimurium R-type AKSSuT, and 7% (38/546) were S. Newport R-type ACSSuT; no other multidrug resistant patterns accounted for more than 5% of multidrug resistant Salmonellae. Ceftriaxone resistance (> 64 mg/ml) was present in 76% (29/38) of S. Newport R-type ACSSuT isolates, 3% (2/63) of S. Typhimurium R-type AKSSuT isolates, and 0.6% (15/2512) of other Salmonella isolates.

Conclusion: Three multidrug-resistant strains account for a substantial proportion of antimicrobial resistance among Salmonella; ceftriaxone resistance is present in two of the strains. Further studies are needed to determine sources for these strains and to support prevention efforts.

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